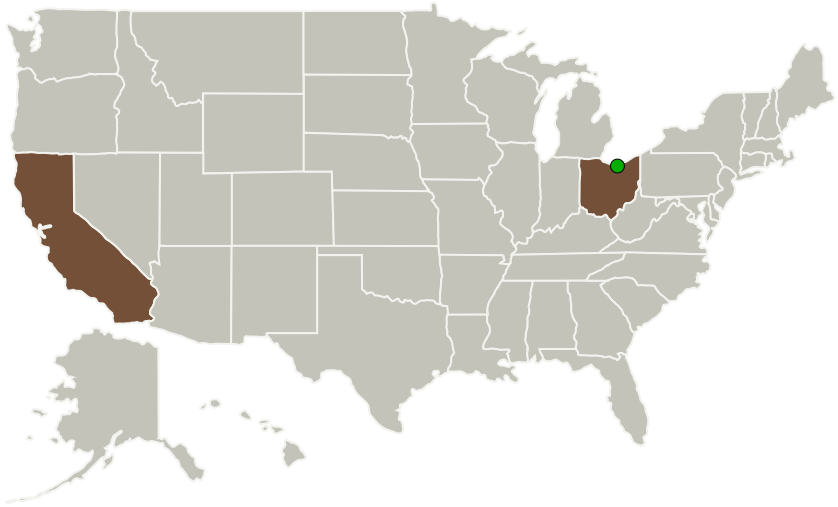
Non-Flammable Crew Clothing Utilizing Phosphorus-Based Fire Retardant Polymers, Phase I

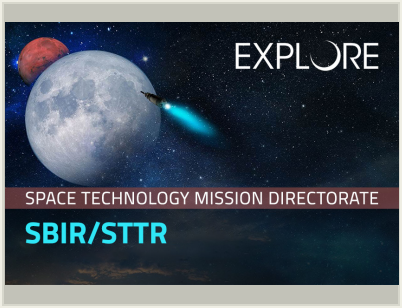
Completed Technology Project (2010 - 2010)

Project Introduction

For maintaining U.S. leadership role in space exploration, there is an urgent need to develop non-flammable shirts, shorts, sweaters, and jackets without compromising the comfort and flexibility of the fabrics. InnoSense LLC (ISL) proposes to utilize its phosphorus-containing ionic polymers in crew clothing. In Phase I, this project would demonstrate flame retardancy and perform standard tests showing adequate comfort, appearance, durability, and non-toxicity, which can be realized from ISL polymers. The overall goal is to take existing fabrics, with their desirable physical properties and high level of comfort, and inserting flame retardancy. The innovations of the proposed approach will offer durability of the treated fabric since the polymers will be covalently bonded to the fabrics. Phase I evaluation will also include biocompatibility of the treated fabrics. Fine-tuning and process scale up will be accomplished in Phase II.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Innosense, LLC	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Torrance, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140643)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Innosense, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

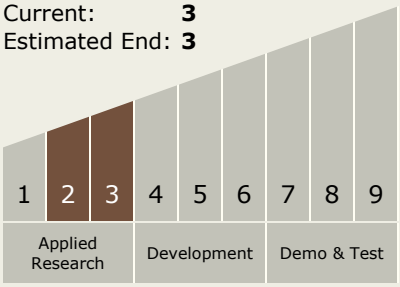
Carlos Torrez

Principal Investigator:

Tania Betancourt

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Completed Technology Project (2010 - 2010)

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.3 Protective Clothing and Breathing

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System